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The Source of Corynebacterium pyogenes Infections*

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Corynebacterium pyogenes is probably the most frequent cause of suppuration in cattle, pigs, sheep and goats, and in cattle it is associated particularly with summer mastitis, endometritis and pyometra, pneumonia in calves, abscesses, polyarthritis, nephritis and granulomatous lesions.

Summer mastitis occurs mainly in dry cows and heifers at grass and usually during the summer months. The incidence varies from year to year and flies have been incriminated as vectors of the infection.

Endometritis with a purulent discharge from the vulva is often associated with *C. pyogenes* and occurs under varying circumstances. In some cases cows have calved and cleansed normally, in others there is retention of the foetal membranes, whereas in others the discharge appears a few days after the animal has been served by the bull. At the moment there is no evidence that trichomonas and brucella infections are necessarily associated with this discharge. It is, however, not a new condition, and Beaver (1922) considered streptococci and *C. pyogenes* to be the most important organisms concerned in the infections of the uterine tract of the cow.

Pneumonia in calves is often associated with *C. pyogenes* and *post-mortem* the lungs show consolidation, areas of necrosis with suppuration and a fibrinous pleurisy with adhesions.

C. pyogenes is frequently isolated from abscesses in cattle following trauma and may be found in the lesions caused by the penetration of the reticulum by foreign bodies; it may also be recovered from abscesses in the liver and kidneys.

It has been stated in recent literature that abortion in bovines is sometimes caused by *C. pyogenes* and that when this is so it occurs between the 12th and 24th weeks (*Anon*, 1942); although this organism has been isolated from aborted foetuses the evidence that it is the primary cause of abortion is apparently very slender. One of the earliest records is that of Smith (1919) who isolated *C. pyogenes* twice in a study of 109 cases of abortion which had occurred in one herd during a period of two and a half years and 62 of these were due to *Brucella abortus*. The relative importance of this condition in Germany may be judged from the reports of the Seventh Conference for the Control of Diseases associated with the Breeding and Rearing of animals held at Bonn in 1934 (Miessner and Koser, 1934). Of 103,023 cases of bovine abortion, *C. pyogenes* was isolated from one foetus and from 33 uterine secretions.

PROBABLE SOURCE OF *C. pyogenes* INFECTIONS

Infectious diseases caused by obligatory parasites may arise from one of two sources :—

(*a*) The importation into a community of a particular strain of bacterium which spreads from animal to animal.

(*b*) The distribution of a potentially pathogenic bacterium in an animal population without the appearance of clinical disease except when initiated by some other factor.

The evidence that *C. pyogenes* infections fall under the first heading is drawn from certain clinical observations. The association of summer mastitis and flies is well recognised and a recent statement has been made that there is some evidence that flies may spread the infection from cow to cow (*Anon.*, 1942). Campbell (1941) points out that it is impossible to avoid the conclusion that they are likely to be carriers of the disease when a cluster of flies is seen on the end of an affected cow's teat. He speculates, however, that infection may remain latent over a long period and break into activity when favourable circumstances arise. *C. pyogenes* infection of the uterus has been classified as a venereal disease transmitted by the bull (Gould, 1942; *Anon.*, 1942). Others suspect the bull of spreading the infection (McEwen, 1942) and *C. pyogenes* has been isolated from discharges from the vulva a few days after an animal has been served by the bull (Hignett, 1940). Pneumonia in calves from which *C. pyogenes* has been isolated may occur on a particular farm in the form of an epidemic which suggests the importation of the organism.

On the other hand, certain clinical observations appear to support the second source. Sporadic cases of *C. pyogenes* infections such as mastitis and abscess formation occur with no evidence of the introduction of an infecting organism and *C. pyogenes* has been recovered from cases of calf pneumonia following infection by *Actinobacillus actinoides* and from calves which, because of brucella infection, were born prematurely. In both cases *C. pyogenes* may be regarded as a secondary invader which multiplies in tissue which is already damaged or not inflated (Smith, 1921, 1925). *C. pyogenes* may complicate and participate in pasteurella infections of the lungs of pigs and calves (Pütz, 1904; Lovell and Hughes, 1935), in agalactia in sheep and goats (Carré, 1912, 1927), and it may cause severe joint lesions in cases of foot-and-mouth disease (Weinberg *et alia*, 1938). *C. pyogenes* is also a common pus-forming agent in cattle following infection with *F. necrophorus* (Künnemann, 1903) or some injury and Ochi and Zaizen (1936) isolated it from 29 of 30 cases of pyogenic infections most of which followed traumatic gastritis.

There is direct evidence that *C. pyogenes* is present in certain normal healthy cattle for Ochi and Zaizen recovered it from 34 of 100 specimens of mucous membrane of the mouth, from 2 of 20 specimens of nasal mucus, from 6 of 11 specimens of vaginal mucus, and from 3 of 32 samples of urine. In this country Francis (1941) isolated *C. pyogenes* 18 times from 100 pairs of bovine tonsils and once from the vagina of 40 cows. Recently it has been recovered from 6 of 100 nasal swabs of sheep, from 2 of 84 tracheal swabs and Bosworth (private communication) has recovered it from the cervix of normal healthy cattle.

There is also indirect evidence that *C. pyogenes* is widely distributed in normal healthy cattle and in addition in pigs, sheep and goats. A comparison of the antitoxin content of the sera of different animal species reveals a marked difference between that of the sera of bovines, pigs, sheep and goats on the one hand and horses, rabbits and man on the other (Lovell, 1939). The sera of bovines, pigs, goats and sheep show high mean antitoxin values with a great degree of variability. The samples from rabbits and man have low values with little variation; the mean and the variability are only slightly higher in horses. In bovines, there is an association between the frequency of large amounts of antitoxin and increasing age and a suggestion of a higher content of antitoxin in the sera of females. It is concluded that the greater amount of antitoxin in cattle, sheep, pigs and goats is due to the stimulus provided by living *C. pyogenes* and that a large number of individuals belonging to these species carry *C. pyogenes* as part of their normal flora. The development of lesions due to this organism points to a latent infection which has been stimulated by some factor such as *Brucella abortus*, *Actinobacillus actinoides*, pasteurella, the organism of agalactia and the virus of foot-and-mouth disease. Trauma may also act as a factor but there are undoubtedly many of which we are ignorant.

If the endogenous development of disease due to *C. pyogenes* in animals is accepted, then the elimination of infection from a herd or area becomes impossible and the prevention of clinical cases falls under two headings :—

(*a*) The control of factors which initiate the disease.

(*b*) The increase of the animal's resistance by some form of immunisation.

Two main conditions are summer mastitis and pyometra and, although reasons have been given for not accepting the fly as a vector, the irritation set up by flies may assist in the production of mastitis. Any method which reduces this irritation should not, therefore, be disregarded. There is at the moment no definite indication as to the factor which initiates endometritis and pyometra in cattle but indiscriminate and undue interference with the genital tract of bovines would appear to be undesirable. The attempts made to increase the milk yield throughout the country in the winter may have their dangers for cows are encouraged to calve at unnatural periods by interference with the oestral cycle and the hormones controlling it.

The simplest method of controlling an infection with such a high carrier rate is by some means of immunisation. For this purpose a toxoid has been prepared which when precipitated with alum induces the formation of antitoxin in the blood of injected animals (Lovell, 1941). At the moment this product is on trial in the field and cows are given two doses of 10 c.c. subcutaneously with an interval of six to eight weeks. Its actual value in the field awaits assessment.

(*References overleaf*)

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Discussion

Mr. S. J. Edwards complimented Dr. Lovell on his paper, and said that summer mastitis of cattle was a condition which must have been encountered by most practitioners and its clinical features had been well described. It was an acute suppurative condition of one or more quarters of the udder, in most instances accompanied by constitutional symptoms. It occurred seasonally, during the summer months, in dry cows and heifers. In addition, the disease was localised to certain areas of the country and even to certain farms or fields. In the country as a whole the incidence of mastitis caused by *C. pyogenes* was considerably less than that caused by *Str. agalactiae*, but in certain areas the ravages of summer mastitis might, at times, far outweigh those caused by chronic mastitis. It was for this reason that farmers in these areas were more concerned with developing preventive methods for summer mastitis.

He wondered whether Dr. Lovell could tell them whether there were any direct experiments on the methods of infection, more especially on the establishment of udder infection *via* the teat canal. It seemed to him that it would be necessary to investigate this question first, before incriminating flies, which were commonly believed to be vectors of the organism.

Suppurative Pneumonia in Calves.—When investigating the causes of death in 100 calves up to a few months of age, Lovell & Hughes (1935) found that 12 cases could be attributed to a pure infection with *C. pyogenes*. An interesting finding was that seven out of these 12 cases were from the same farm. In five further cases this organism was found in association with pasteurella. Apparently the disease was generally sporadic in origin and only affected single calves. Occasionally, however, it occurred as a mild epizo tic. He could recall one such epizoötic on an institute farm, where a number of young calves, aged three to four months, and housed together, showed the same symptoms of unthriftiness, chronic cough and a purulent nasal discharge. *Post-mortem* examination of these animals showed lesions typical of *C. pyogenes* infection as described by Dr. Lovell. The adoption of individual pens for rearing calves should prevent the spread of infection amongst them and the practice should be augmented by the use of separate buckets for feeding.

If he interpreted Dr. Lovell's views correctly, he accounted for the origin of infection in one or other of two ways: (1) by the sudden appearance, through contagion, of a strain of *C. pyogenes* in a susceptible host, or (2) by the *resuscitation* of the organism in the host by some secondary factor.

Dr. Lovell had presented evidence which largely supported his second view on the origin of these infections, and although he agreed that the isolation of *C. pyogenes* from normal animals explained the origin of certain diseases, he did not agree that it could be applied to explain the origin of all *C. pyogenes* infections, particularly summer mastitis. Where the organism normally existed on mucous membranes such as those of the nasopharynx or vagina, it was conceivable that secondary factors might produce infection of these tissues. On the other hand, the appearance of the organism in the udder must be due to infection from some pre-existent focus, whence it was transported by way of the blood or lymphatic stream because, so far as he was aware, *C. pyogenes* did not cause latent infection of the udder.

Endometritis might follow injuries to the mucosa and, more commonly, retention of the foetal membranes. In the latter condition rapid involution of the uterus did not take place and the cervix did not contract normally, with the result that infection of the endometrium occurred. He would like to know whether Dr. Lovell had examined specimens from the uterus at stages after retention of the membranes, in order to find out when *C. pyogenes* invades the uterine mucosa.

Prophylaxis.—(1) It was interesting to hear that Dr. Lovell had commenced to use toxoid for this purpose and it would be an important advance if an active immunity to *C. pyogenes* infections could be developed.

(2) Fly repellents had long been applied to the teats of dry cows in an attempt to prevent summer mastitis. The old-fashioned mixture of Archangel tar and lard was still applied and farmers who used it regularly were convinced that such treatment reduced the incidence of the disease, but the modern practice of injecting an antiseptic paste into the teat was probably superior.

Mr. Edwards did not entirely agree with Dr. Lovell's suggestion that the apparent increase in the incidence of endometritis might be due to surgical interference with the reproductive organs.

Mr. D. L. Hughes wished to pay tribute to Dr. Lovell for his work during the last five or six years on *C. pyogenes*. Most of the recent additions to our knowledge on the subject were due to his efforts. He had presented considerable evidence that most *C. pyogenes* infections were endogenous in origin. Mr. Edwards doubted whether such infections as summer mastitis and calf pneumonia could be endogenous, but the existence of precipitating factors might allow organisms which were already present in the animals, to cause infection.

It was the opinion of many people that some of the ailments of the modern dairy cow were the result of the unnatural life it was forced to live, and the various war-time measures to force production, such as the effort to boost the winter milk, might well result in an extension of these ailments. It was possible that *C. pyogenes* pyometra in the cow was such a condition. In his opinion it was more than a simple infection with the organism.

Certainly the condition in the bitch, as has been pointed out by Wright, was probably bound up with some hormone imbalance.

However, whatever was the real cause of the condition in cows, he would like to ask what was the evidence for saying that the infection was transmitted by the bull? He was unaware of any evidence that was scientifically convincing, and in his opinion it was mischievous for us as a profession to make such statements to the farming community unless the evidence was conclusive.

Mr. G. P. Male thanked Dr. Lovell and Mr. Edwards. They had certainly raised many controversial matters. Referring to this latent infection, he had a cow of his own affected, and studied her closely. There had been no cows brought on to his land for five years. The affected cow was the fourth generation, and there had been no *C. pyogenes* infection in any of her forebears, nor on neighbouring farms. He noticed her lame and found that she had mastitis; he took a milk sample and sent it to Dr. Lovell, who found a pure culture of *C. pyogenes*. He tried sulphanilamide, without effect. Dr. Lovell kindly sent him some toxoid, of which he gave ten injections, and also irrigated the quarter many times, but the disease spread to all four quarters in spite of the treatment and the cow was eventually destroyed. Mr. Male wanted to know where the infection came from, unless from flies.

In another herd two or three cases of pyometra had occurred due to *C. pyogenes*. Dr. Lovell had given him every assistance with these cases, too, and they had tried to cure them with frequent irrigations and toxoid injections, but unsuccessfully. In these cases the cause was attributed to the bull, which had a discharge. The cows, after service, had a rash and a discharge. If there was a general infection of many animals, there must be some other factor to stimulate it. Dr. Lovell had suggested that manipulation might be the stimulus. Mr. Male did not agree with Dr. Lovell on this point; he thought this would be more likely to help to get rid of the organisms as manipulation would, in his opinion, stimulate the ovaries to function better, so obtaining more healthy genital organs.

Professor Bosworth thought that a discussion on this subject was timely if only as a reminder that views which had gained such wide currency were only one side of the story. *C. pyogenes* infections were extremely common in cattle, but there was nothing new in that; if any further evidence of the distribution of the organism in the cattle population was required he could say that he had rarely examined pus from an ulcerating actinomycotic lesion or uterine exudate from a case of retained placenta without finding it. He enquired as to the nature of the condition which was clinically diagnosed as endometritis and was reputed to account for 80 per cent. of cases of sterility in cattle. Was it an inflammation of the uterus caused by specific bacteria or was multiplication of bacteria dependent on some change in the mucous membrane? He thought Mr. Hughes had done well to draw attention to the possible analogy with the condition in the bitch for it was certain that no aspect of the problem should be neglected. As things were, it was extremely difficult to interpret the significance of organisms found in swabs from the cervix uteri of sterile cows. It was no doubt easy to assume that those bacteria were the cause of the trouble and proceed with treatment accordingly, but controlled observations on normal cattle had yielded information which raised doubts as to how far such an assumption was true. Here was an instance of how unwise it was of them as a profession to hold out hopes of curative results from uncontrolled methods of treatment. The essayist's paper had illustrated the value of fundamental work in the case of *C. pyogenes* infections and the need for its continuance.

Professor Wooldridge congratulated Dr. Lovell on his paper, but could not agree with all his conclusions. He could not support Mr. Hughes' view that uterine infection was primarily due to an hormonal imbalance; he had concluded that the ovarian lesion resulted from infection of the uterus. Dr. Lovell told them that *C. pyogenes* was a normal inhabitant of cattle, but apparently this latent infection did not produce immunity. Professor Wooldridge wondered what grounds there were for believing that the toxoid would produce immunity.

In reply to Professor Wooldridge, Mr. Hughes said he had investigated 45 cases of pyometra in the bitch bacteriologically; the organisms isolated were various pus-producing species. In four cases, which were typical clinically, there was no pus and cultures were sterile, the only lesion being a cystic hyperplasia of the uterine mucosa.

Dr. Lovell thanked his hearers for their appreciation of his paper and he was especially grateful to Mr. Edwards for opening the discussion at short notice. As far as he was aware the only experiments on the production of *C. pyogenes* mastitis were by the introduction of the organism by the teat canal. He could not, however, agree that that was the only or even the natural method of infection. Although *C. pyogenes* might not be found in normal milk that did not preclude the possibility of the organism migrating to the udder following some form of irritation. The seasonal appearance of summer mastitis suggested some external influence. It might well be, too, that the apparent increase in endometritis, which was often associated with *C. pyogenes*, was in some way connected with the greater manipulation to which the uterine tract of bovines was subjected. Mr. Hughes had supported his former colleague and Dr. Lovell was glad that the point concerning the bull and endometritis had been brought forward. There was no actual proof that the bull was implicated; it had been noticed on occasion that vaginal discharges containing *C. pyogenes* were observed shortly after service. On the other hand, it had already been mentioned that *C. pyogenes* had been isolated from the vagina and cervix of normal cows. Mr. Male had had no success with sulphanilamide and toxoid in the treatment of summer mastitis and he would suggest the use of sulphapyridine, which had been credited with curative powers in this disease. Dr. Lovell did not see the necessity for implicating any vector of infection in Mr. Male's case, for if his hypothesis was correct *C. pyogenes* was already present. The agents which stimulated the onset of clinical *C. pyogenes* infections were largely not known. As suggested by Mr. Anderson, lungworms might act as an agent in calf pneumonia and in some conditions another type of bacterium. To Professor Wooldridge the reply might be made that the injections of hormones might behave as such an agent. Professor Wooldridge had raised the question of the stimulation of an immunity in animals already infected. Immunity was a relative state and Dr. Lovell expressed the view that the immunity engendered by a latent infection could be broken down easily, and it was, therefore, desirable to induce an immunity sufficiently high to be of practical value to the host. There was still much work to be done before a clear picture of the pathogenesis of *C. pyogenes* was revealed. Only then should we be able to control these infections adequately.

Weekly Wisdom

Those hard intellectuals whose vision is bounded by what their material brain opens to them do not, in fact, see far. In the life of man unexpectedness is the manifest means to an ordered plan. The pure intellectual is nearly always wrong in his judgment of future probability, no matter how deeply fortified his judgment may be by knowledge of worldly facts. There are tramps who read no books, whose interpretation of what is at present taking place rings truer than that of learned people.—"Diplomacy and God," George Glasgow.

THE VETERINARY RECORD
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"THE JOURNAL OF COMPARATIVE PATHOLOGY"

A VIGOROUS and independent literature is as vital to the life of a profession as the "freedom of the press" is to a democracy. Looking back over the past century one can see how British veterinary literature developed to meet certain needs. Three important periodicals, *The Veterinarian* (1828-1902), *The Veterinary Journal* (1875——) and *The Veterinary Record* (1888——), were founded, apart from their main aim of gradually building up a body of accepted clinical knowledge, to bring about much needed professional reforms and to foster a corporate expression of opinion: as Youatt and Percival said, editorially, in the first volume of *The Veterinarian*, "A watchman is now at his post . . . who will so conduct himself that you shall not wish to displace him. He will occasionally whisper in the ears of the slumberers, whether high or low, that it is time to awake. If a whisper will not suffice, he will speak a little louder; and if the sluggard does not then arouse, he will take him by the shoulders and give him a hearty shake. If he does this with good humour on his countenance, and sincerity in his heart, none can be justly offended; or, if they will—they must."

The Edinburgh Veterinary Review and Annals of Comparative Pathology (1858-65) was founded with the main purpose of drawing attention to the disastrous losses caused by epidemic disease in Great Britain, largely due to importation of cattle from the continent, and sufficiently arousing public opinion so that legislation could be introduced to control the trade in live cattle and prevent the consumption of diseased meat. Information concerning the "Health of Livestock" in each county of the three kingdoms was privately collected, and published. Under the brilliant editorship of John Gamgee, at first assisted by his father Joseph, *The Edinburgh Veterinary Review* contained some of the finest writing in our professional literature. He received no personal reward or even recognition for his labours, but it was mainly as a result of his efforts that the Veterinary Branch of the Privy Council was founded in 1865. John Gamgee was largely responsible for initiating the first International Veterinary Congress (1863) and "gave the system of veterinary state medicine its first push off."

The Journal of Comparative Pathology and Therapeutics was founded in 1888; it was the first veterinary or medical periodical in this country specially dealing with pathology. We cannot easily appreciate the state of knowledge at that time: speaking as president at the first combined medical and veterinary conference on Tuberculosis (1888), Chauveau (Director of the Alfort Veterinary School) said: "In whatever direction one proceeds, at each step forward one is brought into contact with obstacles that are complicated and difficult of approach, one falls into unknown regions, which no sun warms or illuminates. . . . But these obscurities will be dissipated . . . the pathologist may some day succeed in making his work . . . as fertile in laws rigorously deduced as that of the mathematician. Then will be the time for our posterity to launch themselves into abstraction. . . . Meanwhile let us content ourselves with being useful." The time for abstraction in the biological sciences has not yet arrived but *The Journal of Comparative Pathology* has, in its own field, played a leading part in dissipating obscurities. It was at once apparent that it would be, in the widest sense, a scientific journal and whilst the first number contained no statement of editorial policy it was perhaps indirectly expressed in the following statement made in an article on the pathology of haemoglobinuria, "Indeed, it has been the bane of veterinary science, more especially in our country, that everyone essaying to treat of a particular disease, however incomplete and imperfect his knowledge may be of the morbid anatomy of that disease, must formulate a theory that will account for the symptoms. One nowhere finds a writer who has the courage to say—The pathology of this infection is quite unknown; let us be slow to theorise regarding it until we have ascertained more than is yet known regarding its morbid anatomy."

Many of the articles in the first volume illustrate the great advances which have been made in the control of animal disease in this country: there was, for instance, a series of articles by Sims Woodhead on the pathology of pleuro-pneumonia and by Nocard on the diagnosis of glanders. On the other hand, subjects that are topical to-day were discussed: the report of a lecture by Sims Woodhead describing work carried out in conjunction with M'Fadyean on milk-borne diseases was an early example of collaboration between medical and veterinary workers; there were also articles by M'Fadyean on the symptoms and lesions of swine fever, and the diagnosis of pig diseases; there were articles and editorials on tuberculosis and Schütz's original article on the streptococcus of strangles was translated.

It has been said that all authors unwittingly write their own autobiography and certainly much can be learnt of M'Fadyean's personality by reading his editorials. His powers of analysis and criticism, literary ability and outstanding "common sense" in agricultural affairs, probably due to his early upbringing, are at once evident. The freshness of his outlook in the early years—it is perhaps not without general significance that the number of editorials greatly declined after he had passed the age of fifty—is illustrated by the following quotation from the first editorial. "If, for example, the protective influence of inoculation for anthrax with the Pasteurian vaccine is ascribable to certain chemical products generated within the animal body during the germination of the crop wilfully introduced, why not extract such chemical products from a cultivation of the germ carried on outside the body? One could then introduce a suitable dose of this germ-free substance into the animal system, and thus avoid the risk that must always attend the introduction of even the modified germ." The *Journal* is, however, far more than an autobiography; its editorials, original articles, reports and the very valuable abstracts and translations from the then little-known continental literature tell the story of the advance of veterinary science during the last fifty years.

In 1937 a *Festschrift* number was prepared to commemorate the fiftieth anniversary of the founding of the *Journal*. Apart from numerous personal tributes this number is a review of the main phases of Sir John's work and the outstanding features of the *Journal*. The last number was published in March, 1940, and Sir John died on February 1st, 1941.

Readers of veterinary literature throughout the world felt the loss. Discussing the proposal that a "comprehensive veterinary journal" should be produced to replace *The Journal of Comparative Pathology* and to include other veterinary periodicals, the editor of *The Journal of the American Veterinary Medical Association* said: "While we, too, miss *The Journal of Comparative Pathology and Therapeutics*, we feel that time will somehow replace it without having to change the name, style, aim or status of Britain's well-known weekly [*The Veterinary Record*]." *The Journal of Comparative Pathology* was itself originally a comprehensive veterinary journal, but there are now special journals which abstract and review the literature and others dealing with the clinical and professional aspects of our work.

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We have known for some time that Sir John wished the *Journal* to be continued under an editorial board* and it is with real pleasure that we are able to announce the appearance of the first number under its new editorship. The character of the *Journal* had already undergone considerable change to conform to modern needs, and it would appear that it will now be a medium for the publication of scientific articles and reviews; we may miss the trenchant editorials of former years but perhaps their style belonged to a previous generation.

The printers are to be congratulated on their part in preparing the new number. It contains articles ranging from the immunisation of pigs against swine fever, bacteriology and experimental pathology to anatomy, and normal and abnormal nutrition; no doubt articles on the applied physiology of farm animals will be forthcoming. Despite the changes in the character of the *Journal* it is evident that the fine traditions and the high literary and scientific standard maintained for over fifty years by Sir John will be preserved by the present board; this will exercise a beneficial effect on the whole of veterinary research.

We feel confident that both veterinarians and the increasing number of workers engaged in cognate fields will give this journal of veterinary science their whole-hearted support.

* See notice in current number of *J. comp. Path.* For a critical appreciation of the part played by the early periodical literature in professional development see *Vet. Rec.* **50.** 875-912.

TREATMENT OF WARBLE-INFESTED CATTLE

In a recently issued notice to stock owners regarding the treatment of cattle infested with the maggot of the warble fly, the Ministry of Agriculture states: In 1942 it was found necessary to suspend operation of the Order which required owners of cattle visibly infested with the maggot of the warble fly to destroy the maggots, partly owing to the lack of supplies of derris root, the essential ingredient of the dressing prescribed in the Order, and partly owing to the shortage of labour on farms. Many stock owners, however, realise the advantages accruing from destruction of the maggots and are anxious to continue to treat infested cattle. A satisfactory substitute for derris dressing is available, in the shape of a dressing composed of a mixture of nicotine sulphate, hydrated lime (not lump lime) and water. The Ministry, therefore, advises all stock owners who are in a position to do so, to treat their infested cattle with this dressing.

A dressing of this nature, which has been shown to be effective in killing the warble fly maggot without causing any ill-effects to the cattle, can be prepared by mixing together a solution of nicotine sulphate (containing 40 per cent. nicotine), hydrated lime and water in the proportion of two fluid ounces of nicotine sulphate solution to 1 lb. of hydrated lime and 1 gallon of water. Both the nicotine sulphate solution and the hydrated lime can be purchased in small quantities from agricultural chemists. The best method of preparing the dressing is first to place the lime in a vessel and then to add water gradually, stirring thoroughly so as to prevent the formation of lumps, and lastly to add the solution of nicotine sulphate. The mixture will then be ready for use, but as it does not retain its strength for more than a short time after it has been made up, it should be prepared only when required for use within an hour of mixing.

Cattle which are infested should be treated with the dressing every four weeks, and, although it is not necessary for the interval between dressings to be exactly four weeks in length, such interval should never exceed 32 days. Dressings should be applied about every four weeks beginning about the middle of March and continuing as long as maggots appear under the skin on the backs of the animals. In order to kill the maggots the liquid must come into contact with them and stock owners should, therefore, be careful to see that the dressing enters all the cavities occupied by the maggots. It is possible to ensure this by applying the liquid with a cloth pressed hard over each hole and if the hole is covered by matted hair or discharge from the hole a rotary movement of the cloth will generally be effective in clearing away the obstruction and making it possible for the liquid to enter. The use of a stiff brush can be recommended for the purpose of removing any scabs which may prevent the entrance of the liquid into the warble holes.

CLINICAL COMMUNICATIONS

A Peculiar Case of Oesophageal Obstruction in the Dog: Congenital Abnormality of the Aortic Arch*

J. J. DAVIES
AND
C. W. OTTAWAY

Subject.—Three-months-old greyhound puppy.

History.—Since weaning the puppy had exhibited difficulty in swallowing food. It could swallow liquids easily and could even manage soft foods if given in small quantities, whereas solid food would be vomited in 10 to 15 minutes. There was no sign of respiratory distress.

Examination.—An examination was made with the oesophagoscope. It was found that as the tube entered the thorax it became filled with food material which rendered vision impossible and indicated a considerable dilatation of the oesophagus. A flexible probe could, with careful manipulation, be directed into the stomach. The thorax was then X-rayed but no abnormality was revealed, though if a barium meal had been given the picture would undoubtedly have been helpful in arriving at a diagnosis.

Treatment.—The oesophagus was opened at the entrance to the thorax. Difficulty was again encountered due to the oesophageal contents in spite of the fact that the puppy had been fasted for 24 hours. On probing with the finger the dilatation in the oesophagus was found to be extensive. Towards the posterior border of the dilatation a hard cartilaginous object was palpated which resembled a foreign body in the wall of the oesophagus. This caused some confusion and it was only on *post-mortem* examination that the "object" was found to be the arch of the aorta. The oesophagus, situated on the left of this "object," was felt to be constricted.

Since no surgical relief could be applied the patient was destroyed.

Post-mortem Findings.—The significant feature of this case was a developmental abnormality of the aortic arch. Although this apparently had no adverse effect on the distribution of blood throughout the body, it so altered the course of the trachea and oesophagus as to cause grievous effects. In the normal animal the trachea and

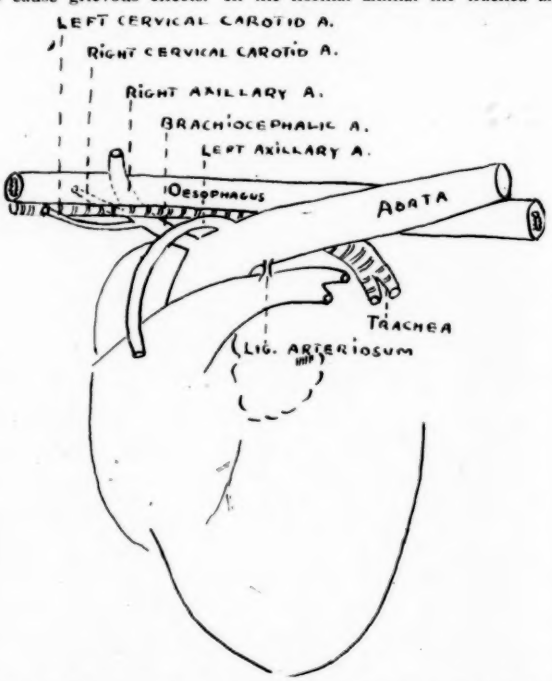

FIG. 1.—Diagrammatic representation of the aortic arch and its relation to the passage of the trachea and oesophagus in the normal dog.

* Case presented, with specimen, to the November, 1942, meeting of the Central Veterinary Society.

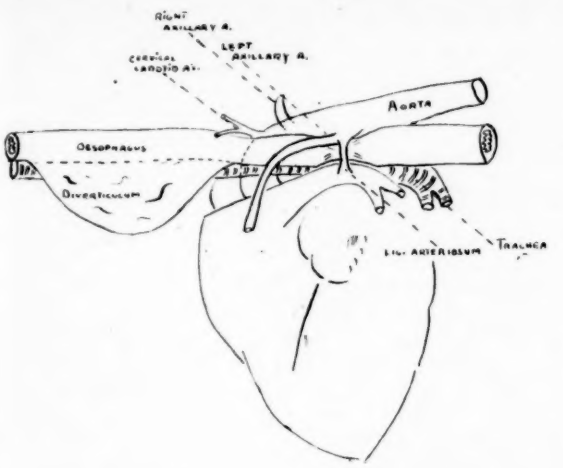

FIG. 2.—Diagrammatic representation of the abnormal aortic arch showing fixation of the trachea and oesophagus between the aorta and ligamentum arteriosum.

oesophagus pass together through the anterior mediastinum over the brachiocephalic trunk, then over the base of the heart on the right side of the aorta (see Fig. 1). In this case the trachea and oesophagus passed below the level of the abnormal brachiocephalic trunk—bi-carotid and right axillary arteries—over the base of the heart and pulmonary artery on the *left* of the aorta, then *between the aorta and the ligamentum arteriosum* (see Fig. 2). The two were thus enclosed in an arterial circle formed by the ligamentum arteriosum, the pulmonary artery and the aorta.

There was no evidence of constriction of the trachea at this site. This was presumably due to the more resistant nature of the tracheal wall as compared with the oesophagus, as both were subjected to the same pressure from without. The history reveals that there was no marked interference with respiration. This was borne out by the condition of the lungs which were filled with air.

There was, however, a marked constriction of the oesophagus. Posterior to the constriction the lumen was normal, but anteriorly, *i.e.*, in the anterior mediastinal cavity, there was a well developed pouch or diverticulum on the ventral aspect. Before the puppy was weaned milk could pass with little difficulty through the constriction. It is suggested that when more solid food was taken the food became arrested above the constriction and the pouch was formed. The food would then gradually percolate through into the stomach, the diverticulum acting as a storage chamber in a similar way to the crop in a bird.

Anatomical Discussion.—In order to follow the changes in the aortic arch which led to this condition it is interesting to compare it with the normal.

The first branch of the aortic arch in the dog is the brachiocephalic trunk. This arises from the dorsal aspect of the aorta and passes obliquely across the mid-line of the chest, under the trachea and oesophagus, to be continued as the right axillary (brachial, subclavian) artery. It gives off first the left cervical carotid (left common carotid) artery, then the right cervical carotid (right common carotid) artery as it passes the line of the trachea and oesophagus. There is no bi-carotid trunk. The left axillary (brachial, subclavian) artery arises immediately behind the right also from the dorsal aspect of the aorta. The ligamentum arteriosum is a short trunk uniting the pulmonary artery and aorta, which, at this level, run side by side (see Fig. 1).

In this specimen the first artery to arise from the aorta, approximately 1 inch from the heart, is a short bi-carotid trunk; this soon divides into normal right and left cervical carotid arteries. The next branch is the right axillary artery, which arises immediately behind the bi-carotid trunk from the lateral aspect of the aorta. The left axillary artery arises approximately 1 inch behind the preceding, also from the lateral aspect of the aorta, but above the oesophagus and trachea. The ligamentum arteriosum arises from the junction of the left axillary artery and aorta, passes downwards and slightly backwards over the left side of the oesophagus and trachea to join the pulmonary artery. It is approximately $\frac{3}{4}$ inch long and $\frac{1}{10}$ inch wide, the lumen is completely sealed (see Fig. 2).

We are indebted to Mr. M. R. W. Lewis for assistance in the preparation of the figures.

Patent Interventricular Septum of a Dog's Heart*

TOM HARE

Clinical History (for which I am indebted to Mr. P. J. Cautley, M.R.C.V.S.).—A male Scottie Terrier, aged 18 months, was brought for examination because during the previous week he had vomited on several occasions. The owner observed that each vomitus became more reddened with blood until about eight hours ago he had vomited what appeared to be pure blood. He had been eating well throughout the week and had taken his supper only an hour or two before his last attack. The patient was in a good state of nutrition; his skin was dry and his coat had lost lustre. He sat up quietly during examination, but he was dyspnoeic. Auscultation of the heart revealed a very strong first beat and loud systolic and diastolic murmurs; the second beat was not detected. On receiving the diagnosis of cardiac insufficiency and a very grave prognosis the owner recalled that the dog had been " short of breath " since puppyhood; he had been examined at different periods by two veterinary surgeons and each had advised active exercise daily. Consequently, until this last week, the dog's daily exercise consisted either of long walks or a run behind his owner's pony. On two occasions, when galloping behind the pony he had fallen on to his side gasping for breath, but recovered very soon. Twelve hours after examination the dog died.

On being called in to make a *post-mortem* examination P. J. C. found unusually dry skin, subcutaneous and muscular tissues; no free fluid in the pleural and peritoneal cavities, and a little colourless watery fluid in the pericardium. He brought the thoracic and abdominal viscera to me.

The heart, 104 grammes when empty and washed, was pear shaped owing to pronounced hypertrophy of the right ventricle. The thickness of the wall of the right ventricle was 1·5 cm. and that of the left ventricle was 1·7 cm.; normally the wall of the left ventricle is approximately twice the thickness of that of the right ventricle. The musculi papillares of the right ventricle, particularly those to the infundibular and marginal cusps, were hypertrophied. The infundibulum of the right ventricle communicated with the aortic vestibule of the left ventricle by means of an oval foramen in the septum, of which the long diameter was 1·1 cm. This opening in the septum was between 33 and 50 per cent. larger than that of the pulmonary valve. The colour of the myocardium was of the normal tint; the epicardial fat was wasted. The orifice of the coronary vein was dilated.

The lungs revealed a slight terminal venous congestion with a trace of froth in the bronchi, but there was no oedema and no brown induration. The liver, of normal size, was filled with venous blood and revealed an early " nutmeg." The spleen showed no macroscopic abnormality. The kidneys were smaller than normal; the capsule stripped readily leaving a dark brown coloured cortex pitted with many small partially or completely organised haemorrhages; the inner zone of the cortex showed the greyish opacity of chronic passive congestion. The wall of the stomach and duodenum was thickened and the mucosa was velvety with chronic venous congestion, the fundus and pylorus being suffused with venous blood and studded with numerous haemorrhages. The contents of the stomach and small intestines were confined to fresh or altered blood with mucus.

Comment.—This differs from the picture of a failing hypertrophied left ventricle in the absence of the brown indurated lungs, oedema, cardiac spleen and advanced nutmeg liver. In this case the venous congestion has fallen upon the kidneys, stomach and duodenum. Possibly some of the terminal bleeding into the stomach may have been exacerbated by the vomiting of the last week. The patient had lived a vigorous life and on occasion he exerted himself strenuously. There was no evidence of his having been a " blue " or cyanosed subject. Thus, until the last week, it would appear that despite the congenital opening in the septum the venous blood had been driven through the pulmonary circuit. By hypertrophying the right ventricle maintained the normal circuit of venous blood with the patient at rest. But what happened on exertion? Did venous blood pass into the aorta or did arterial blood pass into the pulmonary artery? Probably by analysing the recorded cases someone might be able to work out what was happening to this dog's cardiac circuit. On balance my inference, from the pathology of this case, is that the right heart failed and thus until the last week of life the right ventricle had compensated for the defect. In a case of patent ductus arteriosus with patent interventricular foramen of a dog's heart, reported by A. B. Orr and myself (*Jour. Path. and Bact.*, 1931, **34**, 799) the left heart failed. This dog also lived an active life for 18 months, collapsing eight days after the onset of failure of compensation.

DISCUSSION

Dr. McCUNN expressed the opinion that Dr. Hare's dissertation on the heart was the best he had ever heard at their meetings: it was concise, it was a fine

(*Concluded at foot of col.* 1, *p.* 104)

* The dog's heart was exhibited at the November meeting of the Central Veterinary Society.

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See next page

REPORT

Medical Planning Research

Summary of Interim General Report*

Medical Planning Research set out to present a plan for the future of medicine in Britain. Drafting members were confined to those under 45 years of age or who had been qualified less than 21 years; they all agreed to proceed by scientific methods. This involves the collection of all available evidence, belief according to the evidence, and readiness to admit error whenever shown by the evidence. At the beginning it was realised that post-war medical organisation would depend on the social pattern of society.

The war has taught us that finance is not a limiting factor to our efforts in any direction. The limiting factors are the amounts of raw material, machinery and labour we possess, and our power to co-operate in their use. After the war we shall have great productive capacity if only we have the will to use it, but more and more people are becoming convinced that planning and control are necessary if our resources are to be fully used for the benefit of the people as a whole.

Sections on poverty, purchasing power and methods of payment bear a remarkable resemblance to the Beveridge Report. It is stated that members of the public should have the feeling that they themselves are paying for the medical services they receive, and they should have a measure of freedom in choosing who shall give them these services. Doctors should retain, as far as possible, the feeling of dependence on their own efforts, and of independence in their relationship with the State. It is emphasised that money spent on a national health service is not money withdrawn from the national income; it merely represents a redistribution.

Discussing principles of administration, it is emphasised that any new departures must be looked upon as scientific experiments, the results of which must be watched, so that where necessary changes can be made.

Any large organisation is subject to a series of mutually opposed forces on the nice balance of which its efficiency depends. These are :—

(1) The technician *v.* the administrator.
(2) Parallelism *v.* hierarchy.
(3) The individual *v.* the committee.
(4) The centre *v.* the periphery.
(5) Uniformity *v.* diversity.

The pull between the technician and the administrator is strikingly illustrated in the civil service: an hierarchial organisation in which administrators are supreme. The result has been that the best technicians have often refused to serve in such an organisation and those who have, have been frustrated and disillusioned. The vivid contrast between the hierarchial and parallel system is well seen in medicine. The latter has been working well in the voluntary hospitals and in general practice while the former is characteristic of the Ministry of Health and the Forces. When one's hierarchial organisation has a genius at its head with wide human sympathies, it is probably the more efficient, but this is unusual, and he generally tends to sacrifice initiative to safety. "It doesn't matter if the patient dies, so long as he does it on the right form." Ultimately, it is on technical rather than administrative skill that the treatment of the patient depends; so technical skill should receive at least equal recompense with administrative ability.

After a consideration of all the evidence the authors say that they are firmly of the opinion that the central authority of the national health service should be a corporate body organised on a regional basis, and not a department of State directly under a minister of the Crown. The formation of this corporate body and the various committees that would be required is discussed in detail. It is emphasised that administrative and technical posts should carry equal seniority and that all posts above the most junior should be publicly advertised. In order to facilitate exchange of personnel superannuation schemes should be mobile, anyone leaving an institution should not be deprived of his superannuation benefit. It is impossible to speak dogmatically but as a general rule posts calling for initiative and enterprise, however senior, should be held by younger men: those requiring wisdom and critical faculties, for example personal relations, by older men.

Regional Health Centres would form the basis for building the National Health Corporation. The remuneration of doctors at these centres would have to be adequate from the beginning of their careers but always related to the amount of work done. Provisions for specialists and hospital services are also discussed.

* For full report see *Lancet*. 1942. ii. 599-622.

clinical description and its conclusions were for the most part logical. The hole was not the foramen ovale, it was a hole in the septum between the right and left ventricles. If they looked into either the right or left auricle they could see the scar where the foramen ovale had been. The position of the hole would not upset the clinical picture.

QUESTIONS IN PARLIAMENT

Milk (Pasteurisation)

Mr. Purbrick asked the Minister of Health the effect of pasteurisation on the vitamins of milk; at what temperature are these vitamins adversely affected and how?

Mr. E. Brown: I am advised that pasteurisation causes no loss of vitamins A and D; that the amount of vitamin B_1 destroyed is too small to be detected by the usual methods of analysis; that the loss of vitamin C, which is present in milk only in small quantities is negligible, and is no greater than would result in raw milk exposed to sunshine for a few minutes before delivery; and that the effect on vitamin E, which is also present only in small quantities, is not known.

Dr. Russell Thomas asked the Parliamentary Secretary to the Ministry of Food, as the death-rate per 1,000, excluding county boroughs, due to non-pulmonary tuberculosis, showed a decrease in 1941, as compared to 1938, of 29 per cent. in the county of Huntingdon, of 30 per cent. in Dorset and remained stationary in Somerset in spite of an additional child population of nearly 60,000 in 1941 in these three counties, what percentage of milk sold for domestic purposes in these counties is pasteurised?

Mr. Mabane: I regret that the information asked for is not available.

Dr. Thomas: Is the Minister aware that the percentage of milk pasteurised in these areas is practically nil?

Dr. Thomas asked the Parliamentary Secretary to the Ministry of Food, as the death-rate per 1,000 due to non-pulmonary tuberculosis showed an increase in 1941 as compared to 1938 of 85 per cent. in Liverpool, of 37½ per cent. in Glasgow and of 36 per cent. is Manchester in spite of a reduction in child population in 1939 of at least 170,000 in these three cities, what percentage of milk sold for domestic purposes in these three cities is pasteurised?

Mr. Mabane: Approximately 76 per cent. of the milk sold in Liverpool for domestic purposes is pasteurised and approximately 80 per cent. in Glasgow and Manchester.

At a later session, Mr. Purbrick asked the Minister of Health the temperatures and periods of application that should be applied to milk to destroy all tubercle germs present therein; and whether he is satisfied that tuberculosis in cows is infectious through their milk to human beings?

Mr. E. Brown: I am advised that the temperatures and periods of application necessary to destroy tubercle bacilli range from about 135° F. for 40 minutes to boiling point for a fraction of a second. The answer to the second part of the Question is "Yes."

Vice-Admiral Taylor: Is not the Minister aware that while that process is destructive of the tubercle germ, it is also destructive of the nutritive value of milk?

Mr. Purbrick asked the Minister of Health whether, as regards pasteurisation of milk, he will define the exact process which it is the policy of his Department to support?

Mr. Brown: Two processes of pasteurisation are prescribed in the Milk (Special Designations) Regulations, 1936-1942, namely, a "holder" pricess whereby the milk must be retained at a temperature of not less than 145° F. and not more than 150° F. for at least 30 minutes, and be immediately cooled to a temperature of not more than 55° F.; and a high-temperature short-time process whereby the milk must be retained at a temperature of not less than 162° F. for at least 15 seconds and be immediately cooled to a temperature of not more than 55° F. New proposals in connection with the control of heat treatment are under consideration.

Mr. Purbrick: Is the right hon. Gentleman assured that those two temperatures and processes destroy all tubercle bacilli in milk?

Mr. Brown: I have answered the Question in the terms on the Paper.

Mr. Higgs: What steps are taken to have these Regulations enforced?

Mr. Brown: That Question would require a much longer answer than Mr. Speaker would allow me to give.

Dr. Summerskill: Are all the right hon. Gentleman's medical advisers unanimous in regard to these processes?

Viscountess Astor: Are they ever unanimous about anything?

. . . . .

Milch Cows (Tubercle Tests)

Mr. Purbrick asked the Minister of Agriculture when he proposes to introduce the testing of milch cows for tubercle germs and the destruction, with compensation, of all found so suffering?

Mr. T. Williams: My hon. Friend's suggestion is, I am afraid, impracticable.

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Britain has subscribed £28,000 in twelve months for equipment and drugs for the Soviet veterinary service.

NOTES AND NEWS

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

Feb. 24th.—Special Meeting of the Editorial Committee, N.V.M.A., 36, Gordon Square, W.C.1, 2.30 p.m.

Feb. 26th.—Annual General Meeting of the Lancashire Division, N.V.M.A., at Liverpool, 2.15 p.m.

Mar. 3rd.—Ordinary Meeting, Editorial Committee, N.V.M.A., 36, Gordon Square, W.C.1, 2.30 p.m.

Mar. 4th.—Meeting of the Central Veterinary Society, Conway Hall, Red Lion Square, W.C.1, 2.30 p.m.

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DAIRY CATTLE DISEASES CONTROL SCHEME

Practitioners' Record Form

It is known that many practitioners have devised forms for the purpose of keeping the records of work performed under the Scheme for the Control of Certain Diseases of Dairy Cattle. Members will by now have been able to judge the value of a particular type of form which they use, and the Association will be grateful if they would send a specimen copy for the information of the Survey Committee, such to be received not later than Monday, March 1st.

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PERSONAL

Birth.—Wight.—On February 13th, 1943, at Sunnyside Nursing Home, Thirsk, to Joan, wife of J. A. Wight, M.R.C.V.S., R.A.F.V.R., a son.

. . . . .

Marriages—Bowen—Thicke.—On February 3rd, 1943, at Bristol, Peter Bowen, M.R.C.V.S., to Joan Thicke.

Hart—Adamson.—On February 11th, 1943, at Sokoto, N. Nigeria, Andrew William Hart, M.A. (Agric.) (Cantab.), M.R.C.V.S., third son of Andrew Dick and Mrs. Hart, Morden, Wareham, Dorset, to Agnes Mary, eldest daughter of the late James Francis and Mrs. Adamson, Kingsway, Waterloo, Liverpool.

Lewis—Parsons.—On February 6th, 1943, E. F. Lewis, M.R.C.V.S., son of Mr. and Mrs. M. Lewis, of Johannesburg, South Africa, to Betty Parsons, daughter of the late J. Parsons, Esq., and Mrs. Parsons, of Beeding, Sussex.

Powell—White.—On January 6th, 1943, by special licence at the Church of St. Philip and St. James, Booterstown, Dublin, by the Rev. E. M. Bateman, M.A., Robert John Powell, M.R.C.V.S., youngest son of Mr. and Mrs. Robert Henry Powell, Shanbally House, Nenagh, Co. Tipperary, to Sheila, youngest daughter of Mr. and Mrs. John White, Liffey Bank, Dublin.

True—Knight.—On February 6th, 1943, at Wokingham Parish Church, John True, M.R.C.V.S., to Katharine Hilary, youngest daughter of the late Canon J. H. N. Knight and of Mrs. Knight.

Williams—Jones.—On January 30th, at the Methodist Church, Ruthin, A. Lloyd Williams, M.R.C.V.S., only son of Mrs. Williams and the late Mr. John Williams, Gillifor, Ruthin, to A.C.W. Mary Lloyd Jones, W.A.A.F., only daughter of Mr. and Mrs. J. P. Jones, Cae Coch, Ruthin.

. . . . .

Forthcoming Marriage—Patterson—Humphries.—James Ralph Patterson, M.R.C.V.S., R.A.F.V.R., younger son of Rev. A. B. and Mrs. Patterson, of The Cottage, Mashbury, Chelmsford, to Audrey Grace Humphries, only daughter of Mr. and Mrs. Humphries, of Lindisfarne, Evelyn Road, Cockfosters, Herts.

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R.C.V.S. OBITUARY

Hamilton, Daniel, Edgerton House, East Parade, Harrogate. Graduated Glasgow, May 26th, 1892. Fellowship May 4th, 1910. Died February 8th, 1943; aged 75 years.

Mr. Daniel Hamilton, F.R.C.V.S.

Mr. Hamilton, the son of a Scottish farmer, was born at Blantyre. After graduation, he commenced practice in the neighbouring town of Hamilton, where he remained for upwards of 20 years. During the last war he served in the Royal Army Veterinary Corps until invalided out, and it was ill-health that caused him to move from Hamilton to take up governmental agricultural inspection work in various parts of the country. He was for a time Ministry of Agriculture and Fisheries inspector at Hull and Grimsby.

The Harrogate Herald recalls that during the last war Mr. Hamilton devised and developed so successfully the Freibank meat depots in Lanarkshire, and he strongly advocated the adoption of the scheme in this country in the early days of the present war. As Veterinary Surgeon and Meat Inspector to the Burgh of Hamilton from 1914 to 1918 he was a pioneer of Freibanks (shops where specially selected and treated meat, otherwise rejected as unfit, is sold) on the same lines as those on the Continent. Other appointments he held in Scotland were those of Veterinary Inspector for the County of Lanarkshire, lecturer on meat inspection, and, for a short time, examiner at the Royal (Dick) Veterinary College, Edinburgh.

Mr. Hamilton came from a distinguished veterinary family: all his brothers were in practice, and his wife, who predeceased him several years ago, was a daughter of the late David McGill, F.R.C.V.S., of London and Paris. He, too, was a fellow of the Royal College of Veterinary Surgeons.

He took a keen interest in agriculture and was a splendid horseman in his younger days. He was a familiar figure at Harrogate's annual shows and assisted with inspections at the Royal and Yorkshire Shows when they came to Harrogate. Mr. Hamilton was a Rotarian and a past President of the Harrogate St. Andrew's Society.

He leaves one daughter, Miss Alison Hamilton.

The Rev. M. A. R. Brockman, of St. Paul's Presbyterian Church, officiated at the service at All Saints' Church, Harlow Hill Cemetery. He paid a tribute to the character and ideals of Mr. Hamilton, saying he was "a man whose character and influence must have touched many lives." The large attendance included Mr. W. T. Macgregor, Mr. A. R. Withers (representing the Yorkshire Veterinary Medical Society) and Dr. Fred Bullock.

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Roll of Honour

Clune, John Joseph, Major R.A.V.C. Graduated Dublin, December 12th, 1917. "Missing at sea" on September 15th, 1942. (Extract from *The Journal of the R.A.V.C.*)

Richardson, Pilot-Officer William Thomas (Jack), Melverne, West Hill, Wadebridge, Cornwall. Graduated London, July 8th, 1935. Killed on active service February 9th, 1943; aged 28 years.

Pilot-Officer Richardson was in partnership with his father, Mr. W. L. Richardson, at Wadebridge, and the heartfelt sympathy of our readers will go out to Mr. and Mrs. Richardson, both well-known figures at Congress, N.V.M.A., in their grievous loss.

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"THE JOURNAL OF COMPARATIVE PATHOLOGY"

As stated in the editorial columns of this issue, the above journal has now recommenced publication. A copy of the current number is being sent to each of the former subscribers. The columns of the *Journal* are open for contributions dealing with veterinary science, and papers bearing on this subject will be accepted for consideration by the Editorial Board. For the convenience of former subscribers, libraries, etc., Vol. 53, of which one part was published in 1940, will be completed. No. 2 will be dated January, 1943, and Nos. 3 and 4 will be published as material becomes available. The price is 6s. per number, or 15s. 9d. for three numbers. Beginning with Vol. 54, the net price of each complete volume of four numbers will be £1 1s., paid in advance to the publishers, Messrs. H. R. Grubb, Ltd., Poplar Walk, Croydon, Surrey.

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Erratum

Chairmanship of the Board of Veterinary Studies, Liverpool University.—We are informed that Professor Craig's title at the time of his death was Chairman of the Board of Veterinary Studies (not Director as stated in our obituary notice, p. 66). Certain changes of title have been made in recent years, as follows: Professor Share Jones was Director of Veterinary Studies until his retirement in 1938. After this, Professor Craig was appointed Acting Director of Veterinary Studies, but in 1942, the titles of Director and Deputy Director of Veterinary Studies were abolished. Professor Craig was Chairman of the Board of Veterinary Studies from 1939.

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VETERINARY COD-LIVER OIL MIXTURES

The Ministry of Food announces that the Order made in 1939 prohibiting the manufacture and processing of cod-liver oil and the mixing of cod-liver oil with vegetable and marine oils except under licence will be revoked as from April 5th, 1943.

A new Order has been made prohibiting the manufacture and processing of any fish-liver oil and prohibiting the mixing of cod-liver oil or any other fish-liver oil with any other liquid for the purposes of animal or poultry feeding, except under licence.

The new Order will come into force on April 5th, 1943, from

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see next page

which date all fish-liver oil mixtures for animal and poultry feeding will be manufactured under the direct control of the Ministry of Food. No licences will be granted for the manufacture of water emulsions of fish-liver oils for animal and poultry feeding.

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THE "NUFFIELD FOUNDATION"

As announced last week-end, Viscount Nuffield has allocated his shares in the Nuffield Organization to the value of £10,000,000 as a capital fund for a charitable trust, the annual net income (approximately £400,000) to be used for the assistance of (1) medical research and teaching; (2) organisation and development of medical and health services; (3) scientific research and teaching in the interests of trade and industry (including agriculture); (4) pursuit of social studies and (5) care and comfort of aged persons. While these objects will normally be furthered in Great Britain and Northern Ireland, Empire projects are not excluded and in the research and teaching categories provision is made for scholarships and other assistance to Empire students.

An insistence on the maintenance of freedom for the exercise of the scientific mind and spirit in the functioning of the Foundation may be deduced from the final clause in the announcement, which reads: "The Managing Trustees are enjoined to consult the appropriate Ministers of Departments of State in connection with any matters of major importance in which they may become interested. They are not, however, to be in any way bound by the views expressed by these Ministers or Departments in carrying out the work of the Trust."

The appointment as one of the seven Managing Trustees of Dr. Engledow, Professor of Agriculture in the University of Cambridge, links that aspect of the Foundation's activities, particularly in its bearing on nutrition, with the vital question of social medicine—an association which is strengthened by the fact that the Chairman is Sir William Goodenough, Deputy-Steward of Oxford University, now presiding over the enquiry into medical education.

At present the headquarters of the Trust will be at the offices of its Chairman, at 54, Lombard Street, E.C.

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BEEF CATTLE AND THE DAIRY BULL

Following a long discussion at a recent meeting, Herefordshire County Agricultural Committee decided to call the attention of the Council of Agriculture to the dangers arising from the indiscriminate use of dairy bulls in beef-producing herds. Similar fears were recently expressed by the Hereford Herd Book Society.

At the Agricultural Committee meeting Mr. D. G. Watkins said that Herefordshire had always been noted for its beef, but the Ministry were now going too far, and dairy bulls were being used on Hereford beef cattle. Presently, when the war was over, there would be a glut of dairy animals, and no beef.

Dr. A. J. Wilsdon, M.R.C.V.S., the Ministry of Agriculture Animal Health Division Inspector, said that in many parts of Herefordshire tuberculosis in cattle was non-existent, and the infiltration and spread of dairy cattle from outside might ultimately lead to the destruction of one of the cleanest areas in the country—Brecon, Radnor and Hereford. The end of this infiltration would be a tragic mongrel breed of cattle fit for nothing but the can. If it were intended that there should be no further beef-producing in this country, and all was to be imported, the sooner it was annnounced the better.—*Farmers' Weekly.*

CORRESPONDENCE

Letters to the Editor should reach the Office not later than by the first post on Monday morning for insertion in following Saturday's issue.

The views expressed in letters addressed to the Editor represent the personal view of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

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CHRONIC BOVINE MASTITIS

Sir,—Mr. Kennedy's article on this subject fully stresses the fact that our knowledge on the relationship of symptoms to infection is slight, and that a wider and more intensive use of centrifuge and microscope would do much to give a directional indication as to infection and subsequent semiology. It is not expected that treatment, *i.e.*, sulphonamide and (in appropriate cases) irrigation, would be greatly assisted, but the condition would be more thoroughly understood. As it is, treatment out-distances our knowledge to a certain degree in several conditions.

Whilst acting as a temporary assistant in an agricultural practice, all cases of mastitis seen were subjected to examination after centrifugation.

From these observation I came to the conclusion that the examination of films of cream would be very helpful in diagnosing the degree of injury, and perhaps mode of infection, in mastitis. It would also appear that examination of films of cream may be a better aid in diagnosing *some* cases of tuberculous mastitis than the orthodox method of using the sediment.

Yours faithfully,

9, Sunnyside Avenue, JOSEPH CASSELLS.
Holytown,
Motherwell.
January 28th, 1943.

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FERTILITY AND INFERTILITY IN THE COW

Sir,—The paper by Mr. Smythe on this subject contains not only much food for thought, but friendly criticism.

In it, he has expressed the opinion that an excess of fluid injected into the uterus may easily lead to its rupture. My experience is that when an excess is reached it is expelled, and I make it a practice in cows to continue with the injection until this occurs, when I withdraw the catheter and carry out a liberal irrigation of the vaginal walls, spashing the irrigant all over them. I regard uterine irrigation in heifers as very limited in its application, being confined to those cases in which it is possible to slide the catheter through the cervical canal. I have found that in the vast majority of cases of infertility in the heifer, vaginal irrigation, with or without other adjuncts, suffices.

Mr. Smythe has allowed for practically everything in his paper with the exception of the neighbour's bull, which, if allowed to roam, may vault the fencing, serve those cows or heifers which one has failed to cure and completely spoil the process of fattening for beef which has been prescribed! In short, he has overlooked the fact that a change of sire—often of a different breed—may succeed.

Yours faithfully,

"Rothiemurchus," J. F. D. TUTT.
St. Cross,
Winchester.

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PASTEURISATION OF MILK

Sir,—As there is a likelihood of all milk being pasteurised in the near future, I wonder why more raw milk from attested herds is not supplied direct to the public. In this town and district about 75 per cent. is sold direct to the local Co-operative Society, where it is pasteurised, whilst the rest of the milk consumed comes from accredited and standard herds. It seems to me to be absurd to pasteurise T.T. milk and allow ordinary milk to be sold instead.

Yours faithfully,

93, Head Street, W. WATERS.
Halstead,
Essex.
February 6th, 1943.

"THE COW, THE CAR AND THE FARMER"

One of many correspondents who forward the following, appearing under the above heading in a recent issue of the *Daily Telegraph*, does so "as the information contained may be of interest to veterinary surgeons who are having difficulty with their Divisional Petroleum Officers"!

In Ithaca, in the State of New York, a farmer had an ailing cow, for which a veterinary surgeon prescribed stiff doses of petroleum.

The farmer persuaded a local shopkeeper to sell him four gallons on the understanding that he would obtain ration coupons for this quantity from the Office of Price Administration. He then wrote explaining why he needed the paraffin.

Instead of sending him coupons the O.P.A. posted him a questionnaire evidently intended as an application for petrol by a motor car owner. The farmer did his best, filling it up as follows:

Make?—Jersey.

Body type?—Two horns, tail, four feet.

Year?—1940.

Rating or seating capacity?—I have never ridden her but I imagine she would seat two.

Mileage?—The "vet." gave her one quart of petroleum and she ran four miles, so I judge she would have gone 16 on four quarts. I can't tell you her speed as the "vet." hasn't yet caught up with her.